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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER
WILKINS III, HARRY D

ART UNIT	PAPER NUMBER
1742	

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12

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/965,946	MIZIA ET AL.	
	Examiner	Art Unit	
	Harry D Wilkins, III	1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 January 2003 and 12 February 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *15-20,23,25 and 26* is/are allowed.

6)☒ Claim(s) *1-14,21,22 and 24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8 January 2003 has been entered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 2, 21, 22 and 24 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Tsai (US 4,210,447) and the *Metals Handbook*.

Tsai anticipates the claimed invention. Tsai teaches (see claim 2) an alloy that contains 0.01-5 wt% Gd, 18-23 wt% Cr, 6-10 wt% Mo, 0.01-0.4 wt% Mn, 58-68 wt% Ni, and 0.02-2 wt% Fe (making up the balance after the other elements were added). The range of Ni is within the presently claimed range and the ranges of Gd, Cr, Mo and Mn overlap the presently claimed ranges. See MPEP 2131.03. Though Tsai is silent as to the ferrite content of the alloy, since the alloy contains large amounts of austenite stabilizing elements (e.g.-Cr, Ni), one of ordinary skill in the art would have expected the

alloy of Tsai to inherently possess less than 5 wt% ferrite. P, S, Si, C and N would inherently have been present in residual amounts as these elements are normally present as impurities in raw materials as taught by the *Metals Handbook* (see page 713).

In the preamble, the recitation "for neutron absorption" has been given little patentable weight because it merely recites the intended use of a known composition and intended use of a claimed product does not obviate anticipation. In re King 231 USPQ 136 (Fed. Cir. 1986). In addition, because the alloy of Tsai overlaps the presently claimed composition, one of ordinary skill in the art would have expected the alloy of Tsai to inherently possess the neuron absorption properties, particularly because of the presence of Gd.

Regarding the presence of other elements in the composition of Tsai, the present claim recites a composition "consisting essentially of", which is defined as leaving the composition open to other elements that do not affect the basic novel properties of the claimed composition. See MPEP 2111.03. In the present case, the other elements, (e.g.-Nb, Ta, Al, Ti) are deemed not to affect the novel characteristic of the present invention, i.e.-the ability to absorb neutrons through the presence of Gd.

Regarding claim 2, Tsai teaches (see claim 2) adding 58-68 wt% Ni.

Regarding claim 21, Tsai teaches (see claim 2) a Ni-base alloy containing 0.01-5 wt% Gd, 18-23 wt% Cr, 6-10 wt% Mo, 0.02-2 wt% Fe, and inherently contains residual amounts of Mn, P, S, Si, C and N as disclosed by the *Metals Handbook*. The balance of the alloy is Ni, with more than 50% by weight being Ni (58-68 wt%).

Regarding claim 22, the range of Fe taught by Tsai (see claim 2) is 0.02-2 wt%. See MPEP 2131.03.

Regarding claim 24, Tsai teaches (see claim 2) adding 0.01-5 wt% Gd.

4. Claims 1 and 3-8 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Kajimura et al (JP 06-192792) and the *Metals Handbook*.

Kajimura et al anticipate the invention as claimed. Kajimura et al teach (see English abstract) a stainless steel having high neutron absorption capacity that contains 0.05-1.0 wt% Gd, 18-26 wt% Cr, 0.1-5 wt% Mo, less than 2 wt% Mn, 10-22 wt% Ni, residual amounts of C and Si, and the balance Fe. The ranges of Ni and Mn are within the presently claimed ranges and the ranges of Gd, Cr and Mo overlap the presently claimed ranges. See MPEP 2131.03. Though Kajimura et al are silent as to the ferrite content of the alloy, since the alloy contains large amounts of austenite stabilizing elements (e.g.-Cr, Ni), one of ordinary skill in the art would have expected the alloy of Kajimura et al to inherently possess less than 5 wt% ferrite. P, S and N would inherently have been present in residual amounts as these elements are normally present as impurities in raw materials as taught by the *Metals Handbook* (see page 141, col. 3, paragraph 1 and page 930, col. 3, paragraph 1).

Regarding claim 3, Kajima et al teach (see English abstract) that the alloy contains 10-22 wt% Ni.

Regarding claim 4, the range of Ni is within the presently claimed ranges and the ranges of Gd, Cr, Mo and Mn overlap the presently claimed ranges. See MPEP 2131.03.

Regarding claim 5, the examples of Kajmura et al (see Table 1) contain 0.07-0.1 wt% Gd and 1.12 -1.36 wt% Mn. Kajimura et al teach (see abstract) an overlapping range of Cr of 18-26 wt%. Kajimura et al teach (see abstract) adding 0.1-5 wt% Mo, and example 15 contains 1.86 wt% Mo.

Regarding claim 6, Kajimura et al teach (see paragraph 42 of translation) that the stainless steel is cast into an ingot by vacuum melting, which is a conventional stainless steel casting method.

Regarding claim 7, most of the examples of Kajimura et al (see Table 1) contain between 11.54 and 12.74 wt% Ni.

Regarding claim 8, the examples of Kajimura et al (see Table 1) contain 0.07-0.1 wt% Gd.

5. Claims 1 and 3-8 rejected under 35 U.S.C. 102(b) as being clearly anticipated by Fujiwara et al (JP 62-056557).

Fujiwara et al anticipate the invention as claimed. Fujiwara et al teach (see English abstract) a stainless steel having neutron-absorption capacity that contains 0.1-3.0 wt% Gd, 15-30 wt% Cr, less than 5 wt% Mo, less than 2 wt% Mn, 7-35 wt% Ni, residual amounts of C, Si, P, S and N, and the balance Fe. The range of Gd is within the presently claimed range and the ranges of Cr, Mo, Mn and Ni overlap the presently claimed ranges. See MPEP 2131.03. Though Fujiwara et al are silent as to the ferrite content of the alloy, since the alloy contains large amounts of austenite stabilizing elements (e.g.-Cr, Ni), one of ordinary skill in the art would have expected the alloy of Fujiwara et al to inherently possess less than 5 wt% ferrite.

Regarding claims 3-5, 7 and 8, Fujiwara et al teach (see Table 1, example 7) an example alloy that contains 1.59 wt% Mn, 12.36 wt% Ni, 17.19 wt% Cr, 2.42 wt% Mo, 1.08 wt% Gd and the balance Fe, with impurity levels of C, Si, P, S and N.

Regarding claim 6, because Fujiwara et al are silent as to any type of processing for the stainless steel. However, the present claim is a product-by-process claim, and the conventional casting limitation of this claim does not materially distinguish the present alloy from the prior art.(MPEP 2113).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kajimura et al (JP 06-192792) and the *Metals Handbook* in view of Shaffer et al (US 4,292,528).

The teachings of Kajimura et al and the *Metals Handbook* are described above in paragraph no. 4.

However, Kajimura et al do not specifically teach that the neutron-absorbing steel could be used as an internal or a canister (as defined in the present specification on page 9, paragraph 23).

Shaffer et al teach (see figure 1) a cask for radioactive material such as spent nuclear reactor fuel. The walled internal compartments 31, 33 and 35 absorb neutrons

(see col. 1, lines 60-61 and col. 2, lines 64-65). Compartment walls 55 and 57 have parts that serve as bearers of neutron-absorbing material (see col. 2, line 67 to col. 3, line 7). Regarding the parts of claims 9 and 10, it would have been obvious to one of ordinary skill in the art at the time the invention was made that the stainless steel taught by Kajimura et al could be used in the cask components of Shaffer et al, since Shaffer et al teach that the cask material could be made from stainless steel (see col. 7, lines 7-24 of Shaffer et al). Also, Kajimura et al meet the requirement in Shaffer et al (col. 7, lines 20-21) for corrosion resistance.

8. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujiwara et al (JP 62-056557) in view of Shaffer et al (US 4,292,528).

The teachings of Fujiwara et al are described above in paragraph no. 5.

However, Fujiwara et al do not specifically teach that the neutron-absorbing steel could be used as an internal or a canister (as defined in the present specification on page 9, paragraph 23).

Shaffer et al teach (see figure 1) a cask for radioactive material such as spent nuclear reactor fuel. The walled internal compartments 31, 33 and 35 absorb neutrons (see col. 1, lines 60-61 and col. 2, lines 64-65). Compartment walls 55 and 57 have parts that serve as bearers of neutron-absorbing material (see col. 2, line 67 to col. 3, line 7). Regarding the parts of claims 9 and 10, it would have been obvious to one of ordinary skill in the art at the time the invention was made that the stainless steel taught by Fujiwara et al could be used in the cask components of Shaffer et al, since Shaffer et al teach that the cask material could be made from stainless steel (see col. 7, lines 7-24

of Shaffer et al). Also, Fujiwara et al meet the requirement in Shaffer et al (col. 7, lines 20-21) for corrosion resistance.

9. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ziolkowski (US 3,362,813) in view of Wachter et al (US 4,010,375) and Rudnick et al (US 5,926,516).

Ziolkowski teaches (see col. 2, lines 7-28) an austenitic stainless steel alloy used for high thermal neutron absorption with the following composition by weight: 0.2-3% Gd, 2-26% Cr, up to 4% Mo, up to 10% Mn, 3.5-22% Ni, 5-25% ferrite, up to 1% P and S, up to 0.25% C, up to 2% Si, and up to 0.7% N. It is inherent that the stainless steel of Ziolkowski reads on a poisoned member, since the steel absorbs neutrons (see col. 1, lines 8-10). Wachter establishes that it is well known in the art that a poison is the same as a neutron-absorbing material (see col. 1, lines 37-38). However, Ziolkowski does not specifically disclose that the poisoned member comprises a spent nuclear fuel storage system as claimed.

Rudnick et al teach (see col. 4, line 1-4) an absorption structure that is used in a fuel assembly storage basin of a nuclear reactor to receive spent fuel assemblies. The structure is made from austenitic steels (see col. 3, lines 64-67), and the structure can contain Gd. It would have been obvious to one with ordinary skill in the art at the time the invention was made that the alloy of Ziolkowski would be used as part of a spent nuclear fuel storage system, since Rudnick et al teach that absorber parts permit compact storage of neutron-emitting components, especially fuel assemblies, from nuclear reactors (see col. 1, lines 18-25).

10. Claims 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ziokowski (US 3,362,813) in view of Wachter et al (US 4,010,375) and Rudnick et al (US 5,926,516) as applied to claim 11 above, and further in view of Shaffer et al (US 4,292,528).

The teachings of Ziolkowski, Wachter et al and Rudnick et al are described above in paragraph no. 9.

However, Ziolkowski does not disclose that the claimed poisoned member, which is comprised of the steel alloy taught by Ziolkowski, is an internal as claimed in claim 12, a canister as claimed in claim 13, or both an internal and a canister as claimed in claim 14 (as defined in the present specification on page 9, paragraph 23).

Shaffer et al teach (see figure 1) a cask for radioactive material such as spent nuclear reactor fuel. The walled internal compartments 31, 33 and 35 absorb neutrons (see col. 1, lines 60-61 and col. 2, lines 64-65). Compartment walls 55 and 57 have parts that serve as bearers of neutron-absorbing material (see col. 2, line 67 to col. 3, line 7). Regarding the parts of claims 12-14, it would have been obvious to one of ordinary skill in the art at the time the invention was made that the stainless steel taught by Ziolkowski could be used in the cask components of Shaffer et al, since Shaffer et al teach that the cask material could be made from stainless steel (see col. 7, lines 7-24 of Shaffer et al). Also, Ziolkowski meets the requirement in Shaffer et al (col. 7, lines 20-21) for corrosion resistance.

Response to Arguments

11. Applicant's arguments filed 8 January 2003 have been fully considered but they are not persuasive. Applicant argued that:

a. Tsai teaches an alloy that contains additional elements;

b. Kajimura et al teach an alloy that contains additional elements;

c. Fujiwara et al teach an alloy that contains additional elements; and,

d. Ziolkowski teaches a wrought stainless steel which is different from the claimed cast stainless steel.

In response to Applicant's first three arguments, the language "consisting essentially of" is read to leave the composition open to only those elements which do not materially affect the novel characteristics of the composition. In the present case, the additional elements of Tsai, Kajimura et al and Fujiwara et al do not materially affect the novel characteristic of the composition, that being the neutron absorption capacity, which is dependent mainly upon the addition of Gd to the alloy. Thus, the additional elements of Tsai, Kajimura et al and Fujiwara et al do not materially affect the ability of the alloy to absorb neutrons.

In response to Applicant's fourth argument, though Ziolkowski teaches that the final state of the alloy is a wrought microstructure, Ziolkowski teaches (see col. 4, line 5) casting of the alloy. Though further processing occurs, the stainless steel of Ziolkowski is cast. Thus, the stainless steel of Ziolkowski meets the claim limitation that the stainless steel is cast.

In addition, because of the large amount of selection from the composition of Burnett et al required to achieve the presently claimed invention, the rejection has been withdrawn. However, a rejection over Burnett would stand or fall for the same reasons as Tsai, so in order to simplify the proceedings of this case, the rejection over Burnett et al has been withdrawn.

Allowable Subject Matter

12. Claims 15-20, 23, 25 and 26 are allowed.

13. The following is a statement of reasons for the indication of allowable subject matter: Regarding claims 15-20, there is no basis to suggest that the cast nickel alloy of Tsai could be wrought, since Merriman teaches that a wrought metal has distinguishable properties from cast metal (page 393). The intent of the alloy of Tsai is only to be cast for dental purposes. Regarding claim 23, the prior art of record, specifically Tsai, does not disclose or suggest the molybdenum concentration. Regarding claims 25 and 26, there is no basis to suggest that the nickel alloy of Tsai could be used as structural components of spent nuclear reactor fuel, as the canister and internal is defined in the present specification. Tsai does not teach that the nickel alloy could be useful in other structures.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harry D Wilkins, III whose telephone number is 703-305-9927. The examiner can normally be reached on M-Th 6:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V King can be reached on 703-308-1146. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Harry D Wilkins, III
Examiner
Art Unit 1742

hdw
March 28, 2003

ROY KING
SUPERVISORY PATENT EXAMINER
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